Patuxent Wildlife Research Center
Science Brief for Resource Managers

http://www.pwrc.usgs.gov
Science Brief PWRC 2003-25

Date:	Contact:	Phone:	Email:	Address:
March 2003	Daniel Twedt	601-629-6605	dan_twedt@usgs.gov	USGS Patuxent Wildlife Research Center 2524 South Frontage Road Vicksburg, MS 39180

Impact of placement of bottomland hardwood forest restoration on avian demography

Description:

Extensive areas of bottomland hardwood forest are being restored on marginal agricultural lands in the Mississippi Alluvial Valley. Additional opportunities exist in conjunction with possible credits for carbon sequestration and increasing areas of short-rotation hardwood forestry for pulpwood or biofuel production. Concerns have been voiced regarding the appropriate landscape context within which to restore these forests. Specifically, what are the environmental benefits of reforesting isolated tracts versus the benefits accrued through reforestation adjoining extant forest. Often questioned is the assumption that isolated tracts function as 'sink habitats' where reproductive output does not compensate for adult mortality. This excess mortality must be compensated through immigration of individuals from 'source' populations. Forest-core habitat is generally assumed to provide this excess productivity.

Progress to Date:

From mid-April to early August, we monitored avian abundance and nesting success on 36 reforested agricultural fields: 10 sites during 2000, 12 sites during 2001, and 14 sites during 2002. Grassland birds (Red-winged Blackbird, Dickcissel, Eastern Meadowlark, Northern Mockingbird, and Mourning Dove) characterized sites that abutted agricultural fields. White-eyed Vireo and Indigo Bunting, birds typical of shrub-scrub habitats, characterized sites adjacent to mature forests. Brown-headed cowbirds were more abundant near mature forests. We located over 2400 nests during this study. Nests were monitored approximately every 3 days to estimate their daily probability of survival. Predation was the primary cause of nest failure. Generalized nest survival of all songbirds (~17%) was similar on sites adjacent to agricultural fields and on sites abutting forests. Tree density was greater near mature forests than near agricultural fields. Restoration that abutted existing forest accelerated colonization by forest birds but nesting success was similar on reforested sites regardless of their landscape position. Reforested bottomlands were population sinks for 5 species (Mourning Dove, Yellow-breasted Chat, Dickcissel, Red-winged Blackbird, and Common Grackle); notably 3 of these species are characteristic of the early "grassland" stage of reforestation. Conversely, reforested bottomlands were population sources for 5 other species that are more commonly associated with shrub-scrub or "forest" stage of reforestation (Yellow-billed Cuckoo, Northern Cardinal, Indigo Bunting, Northern Mockingbird, and Orchard Oriole).

Management Implications:

The most effective strategy by which bottomland reforestation can support avian conservation is through reforestation adjacent to existing large tracts of bottomland forest. Reforested sites within forested landscapes tended to attract more birds that were characteristic of shrub-scrub habitats and appeared to serve as population sources for these species.

Contacts:

Daniel J. Twedt
USGS Patuxent Wildlife Research Center
Vicksburg, MS 39180
Phone: 601-629-6605
Email: dan_twedt@usgs.gov

For more information about Patuxent and our science, please visit our website at http://www.pwrc.usgs.gov